

Seroepidemiological study of gonorrhoea in Ethiopian women

2. Socioeconomic picture

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Abstract

Objectives—To determine aetiological factors associated with the prevalence of gonorrhoea in Ethiopian women to enable subsequent formulation of intervention policies.

Subjects—1851 Ethiopian women: 50% symptomatic, 50% asymptomatic.

Setting—Gynaecological outpatient departments, antenatal, postnatal and family planning clinics (Ethiopian Family Guidance Association (EFGA)), in two teaching hospitals and a mother and child health centre in Addis Ababa, Ethiopia.

Methods—Using the indirect haemagglutination test with gonococcal pilus antigen, sera were tested for the presence of gonococcal antibodies indicating past or present infection. The socioeconomic facts were analysed against gonococcal seropositivity of these women.

Results—Gonococcal infection was associated with very early age at first marriage and first coitus, more than one sexual partner and marital status/profession. The highest prevalence and titres were found in bargirls (100%), prostitutes (89%) and sellers of local beer (85%). The lowest prevalence and titres were found in the highest income group, those

married over the age of 18 years, those with only one husband or sexual partner, and those with a sexual life of less than 5 years duration. **Conclusions**—National measures which could contribute to reduction and control of gonorrhoea include effective raising of the age of first marriage and first coitus, as has already been defined by law; the education of all girls up to fifth grade or equivalent; the provision of financial support to prevent widows and divorcees from drifting into prostitution; regular health checks and treatment of prostitutes; and education of men.

While gonorrhoea *per se* is a major public health problem, our findings must have serious implications in the wider context of possible transmission of HIV through the community.

Introduction

All observers agree on the high prevalence of gonorrhoea in tropical Africa, many emphasising the importance of prostitution in transmitting the disease,¹ but there have been few detailed epidemiological studies including social and economic factors.

The prevalence of gonorrhoea in women increases with more than one marital partner.² Forty per cent of Nigerian city prostitutes were divorced or separated women,³ as were 44% of urban prostitutes in Kenya.⁴ Poverty was a major motive for prostitution, childlessness/sterility may be both a cause of prostitution and/or the result of it.^{3,4}

Control of gonorrhoea or sexually transmitted disease (STD) and its sequelae requires greater recognition of the problems by the health services and at a governmental level⁵ by understanding of the causes for prostitution,⁴ regular health checks for prostitutes,⁴ recognising characteristic patterns of sexual behaviour, and obtaining reliable data on that—this is difficult in the USA and is a far greater problem in Africa,⁶—and education of prostitutes.⁶

Analysis of socioeconomic factors, which may contribute to gonococcal infection, requiring study

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of large numbers of subjects is now possible because an important and reliable epidemiological serological test for demonstration of gonococcal antibodies has recently become available.⁷ This test is not able to distinguish past from present infection. Since gonococcal antibodies in the majority of patients persist lifelong, the test is very suitable for sero-epidemiological surveys, whereas it is seldom useful in the diagnosis of current gonorrhoea.⁷

Patients and methods

Sera from 1851 Ethiopian women were tested for gonococcal antibodies by the indirect haemagglutination test for evidence of current or previous gonococcal infection.⁷ The results of the gonococcal antibody test (GAT) were analysed against the parameters characterising the women's social conditions: ethnic group, religion, family monthly income, age at first marriage and age at first coitus, marital status/profession, number of husbands (that is, sequential number; there is no polyandry) and sex life duration. The study population is described elsewhere.^{8,9}

Statistical methods

Statistical analysis was made using the chi square test to determine the significance level of any kind of association found between GAT seropositivity and other recorded data for the various groups of patients.

Results

Sero-positivity and ethnic group, religion, origin

The association of gonococcal infection with ethnic group, religion and origin is shown in fig 1. There were significantly ($p < 0.001$) more seropositives in the Amhara (66%: 715/1080) and Oromo (66%: 179/271) women, followed by the Tigre (50%: 74/149), and then in the Guragie (33%: 94/281) and other ethnic groups (37%: 24/65); ethnic group information was missing for 5 patients. There was significantly ($p < 0.001$) more gonococcal infections in those who were Ethiopian Orthodox (62%: 1008/1628) compared with the Moslems (35%: 65/185). The percentage of seropositive women of "other religions" (chiefly from the protestant Christian churches) was similar to that of the Moslems, but the number of these women was not sufficient for statistical analysis.

When the origin of the women is analysed it is evident that there is rather more gonococcal infections ($p < 0.1$) in urban (60%: 900/1505) than rural women (54%: 170/312); origin data were missing for 34 patients.

Seropositivity and monthly family income

The association of GAT positivity and family monthly income is shown in fig 2 ($p < 0.001$). There is a clear decrease in percentage of seropositivity with rise of income but there is little difference between the three lowest income groups. Of those with family income < 10 EB, 10-50 EB, 50-100 EB respectively

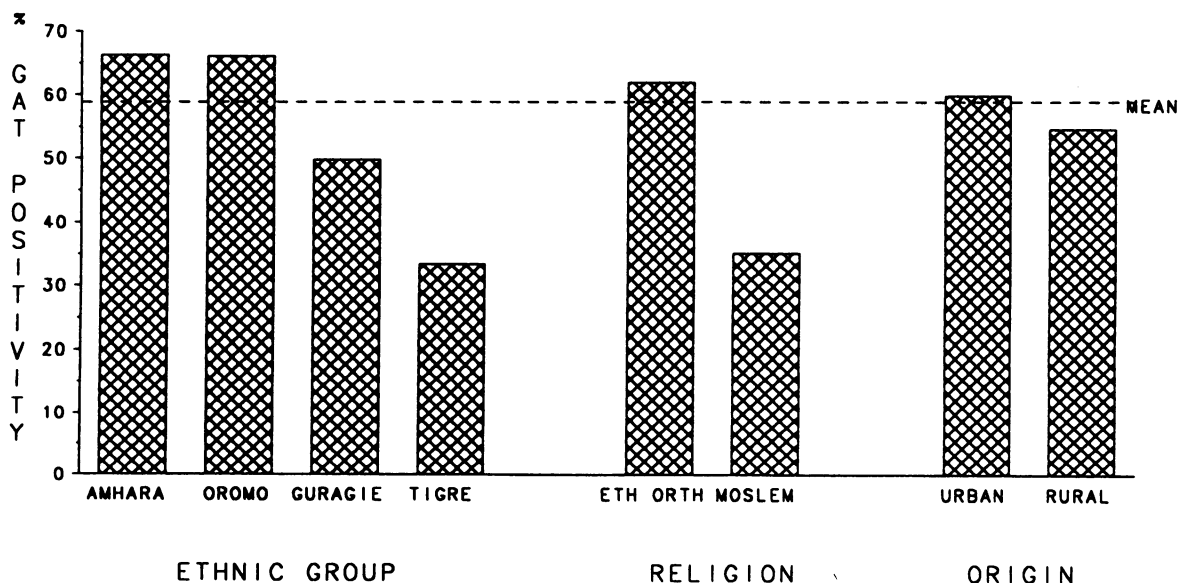


Figure 1 Gonococcal antibody tests seropositivity and ethnic group, religion, and origin. Eth Orth = Ethiopian Orthodox Christian.

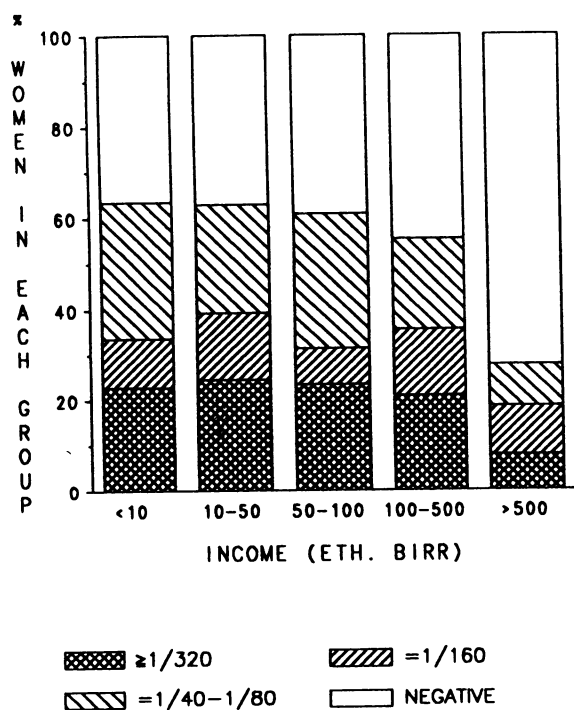


Figure 2 Gonococcal antibody test seropositivity and monthly family income. Eth Birr = Ethiopian Birr. (2 Ethiopian Birr = 1 \$ US).

64% (209/329), 63% (377/599), 61% (93/163) were seropositive, compared with 55% (141/255) and 28% (18/65) with income 100-500 EB and > 500 EB (income data missing for 450 patients).

Seropositivity and age at first marriage/coitus

Seventeen patients were single; data on age at first marriage or age at first coitus were missing for 87. All but 0.8% (14/1747) other patients were married as virgins. Child marriage was frequently practised; in some cases the child was living with her mother-in-law until she was considered old enough for consummation of marriage: 5% (88/1747) had first coitus older than first marriage. For 1645 patients, age at first marriage and age at first coitus have the same value. It follows from this that these variables are equivalent for the statistical analysis and show the same association with other factors. There is a highly significant ($p < 0.001$) association between the presence of gonococcal antibodies and the age at first marriage and age at first coitus (fig 3). There is increase in seropositivity with decreasing age at first marriage and first coitus and an increase in the percentage of those with titres $\geq 1/320$, and $1/160$.

Seropositivity and "marital status"/profession

The association of these factors is shown in fig 4

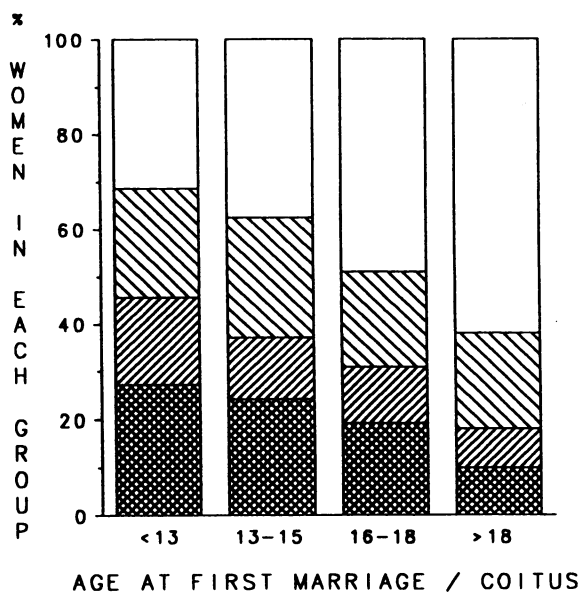


Figure 3 Gonococcal antibody test seropositivity according to age at first marriage/coitus.

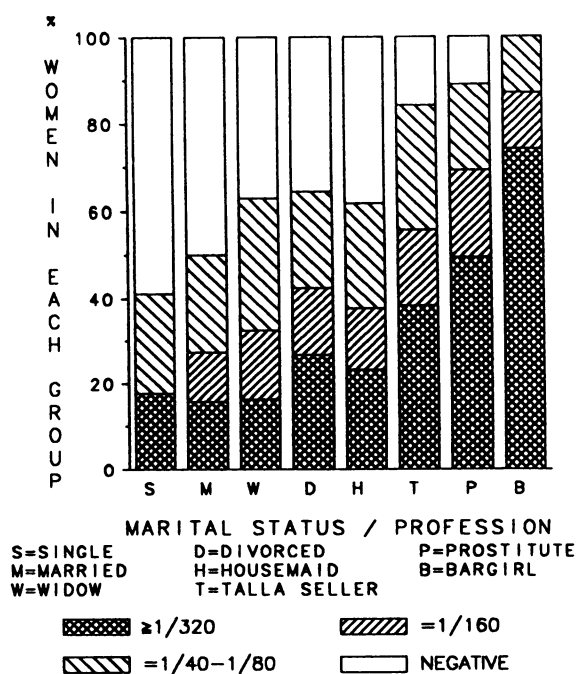


Figure 4 Gonococcal antibody test seropositivity according to marital status/profession.

($p < 0.001$). Prevalence of seropositives according to marital status/profession is of very considerable interest. Particularly striking is that all bargirls were seropositive, followed by the prostitutes (11% seronegatives: 10/91) and talla sellers (makers and sellers of local beer) (16% seronegative: 19/120).

Seropositivity and number of husbands/male sexual partners

There is an impressive difference in levels of gonococcal antibodies according to the number of husbands/sexual partners ($p < 0.001$) (fig 5). The group of women with > 5 partners was comprised chiefly by bargirls, prostitutes and talla sellers and 88% (233/265) of these were seropositive. The group of women still married with their first husband have strikingly less evidence of gonococcal infection (44%: 303/800) but this is a very high percentage.

Seropositivity and sex life duration

There is a stepwise increase in percentage of seropositives during 5 to 15 years of sex life ($p < 0.001$) (fig 6). Already after 5 years of sexual activity, the percentage with high titres ($\geq 1/320$) remains constant, 22–25%. Regression analysis shows that the association between seropositivity and sex life duration is not due to the age factor.

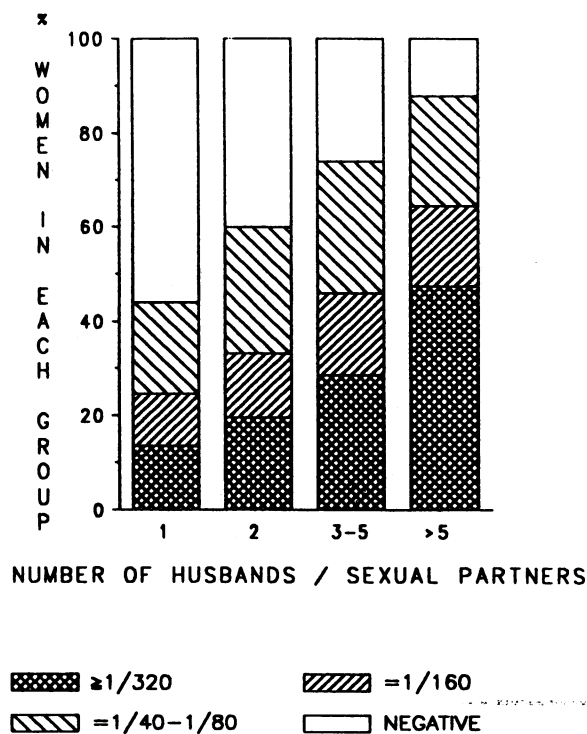


Figure 5 Gonococcal antibody test seropositivity according to number of husbands/sexual partners.

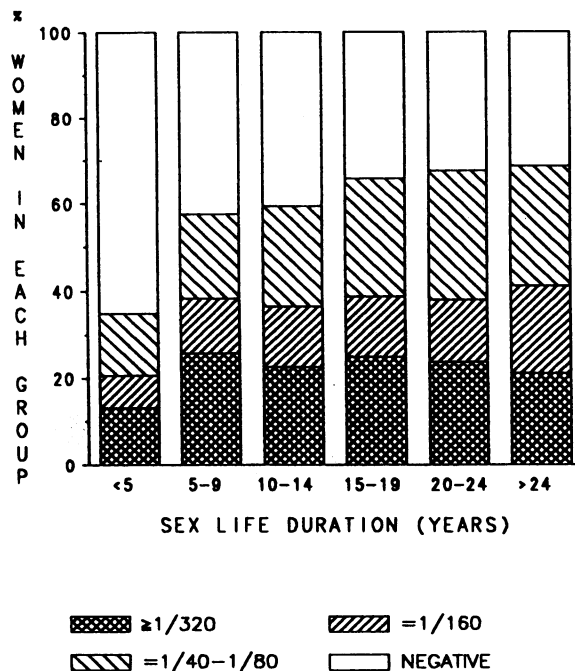


Figure 6 Gonococcal antibody test seropositivity according to duration of sexual life.

Discussion

When one compares the association of GAT results with ethnic group, religion and origin it appears that ethnic group is actually a stronger factor than religion for significance of more gonococcal infections. This may well be influenced by the origin of the women, and reflects the difference in other socioeconomic factors, particularly age at first marriage which is closely related to family income. It is well recognised that ethnic and cultural patterns of behaviour break down with increased urbanisation. This has already been shown to have occurred in other parts of Africa,¹⁰ where many cultures normally expecting their women to retain virginity until marriage have seen the practice of "bride-price" rapidly disappearing, and as a result a younger age for sexual union and an increase in premarital coitus.¹⁰ The fact that the Amhara ethnic group comprises the greater part of the population of the city of Addis Ababa may have distorted the true prevalence of gonorrhoea in the Amhara tribe. As 90% of the population of Ethiopia live in rural areas or small townships, further detailed studies investigating women in rural areas and the smaller townships are recommended.

Early age at first marriage is for many an economic necessity. Those married very young and with first coitus before the age of 12 have many episodes of gonorrhoea, shown by the high titres. First coitus occurs often before puberty and the menarche and

thus before the development of hormonal and immunological defence factors, and may cause physical trauma to both the introitus and the vaginal epithelium.⁹ Early age of marriage has in itself been shown to have certain socio-economic consequences. It has been reported elsewhere that the earlier the first marriage the less stable that marriage was, the greater risk of breakdown of marriage, divorce and remarriage, multiple partners and eventually the young woman running away from home to seek a better way of life in the urban areas where the only means of support is frequently by prostitution¹¹ or working as a maid. The analysis of our results is consistent with this observation, as there is least evidence of gonococcal infection in those who were first married over the age of 18.

Further analysis of the group of married women shows that of those who were married and had one sexual partner, significantly fewer had gonococcal infections than those who had had several husbands, although the fact that they did have gonococcal antibodies present (44%) suggests a male factor or male promiscuity.⁹ As outlined by Willcox, male promiscuity results in transmission of infection from a highly infectious promiscuous female pool to secondary sexual contacts, most commonly wives.¹²

The heart of the problem for much of Africa, with regional variations, is the economic changes which create a large group of single young men in their sexually most active age. Increasingly numbers of "single" men migrate to the urban areas in search of employment, frequently to earn a "bride-price", while women widowed or divorced turn to prostitution—an economic necessity—to support themselves and their children.⁴ Increasing urbanisation has resulted in the breakdown of traditional customs and taboos. In many cultures premarital pregnancy was once considered a "serious offence", but it is now increasing, particularly in the towns where up to 50% of pregnant women are unmarried.¹⁰ With the disappearance of the "bride-price", women are now sexually active at a younger age.¹⁰ Of university students in a central African town 98% attributed their gonorrhoea to prostitutes,¹ as did 49% of Sudanese men.¹³

Our results suggest that the chief reservoir of infection was amongst the bargirls, prostitutes and talla sellers, in that order. These findings must have serious implications in the wider context of possible transmission of HIV through the community.¹⁴

National measures which could contribute to the reduction of gonorrhoea include raising the age of marriage and first coitus, as it has already been defined by law, and the education of all girls, at least up to the equivalent of fifth grade, which is an effective way of raising the age of marriage and in reducing dramatically maternal and child mortality.¹⁵ The provision of an unemployment benefit, widow's pension or some form of social security payable to widows and divorcees, to enable them to support

themselves without having to resort to prostitution, could well bring about a reduction in numbers of talla sellers, particularly among the older women. As has already been noted, most prostitutes in Addis Ababa are in that profession because of economic necessity, not because of personal wish (Dr Debrework Zewde, personal communication).

Regular health checks of prostitutes, with examination, treatment and contraceptive advice, particularly regarding the use of condoms, would enable those most at risk to be diagnosed early and treated, thus reducing the reservoir of infection in the community as a whole.¹⁶

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